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EXAMINER

HORNING, JOEL G

ART UNIT

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1792

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DELIVERY MODE

03/13/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/566,741	Applicant(s) MACOR ET AL.	
	Examiner JOEL G. HORNING	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) 19 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05-01-06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Restriction is required under 35 U.S.C. 121 and 372.

1. This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group A, claim(s) 1-17 and 21, drawn to a process for the production of strongly adherent coatings.

Group B, claim(s) 19-20, drawn to strongly adherent coatings.

The inventions listed as Groups A and B do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the common technical feature between the groups is the coating of claim 19. US 6548121 teaches the production of such a coating. The produced coating is a metal coating deposited on a coating of photoinitiator which is deposited on a plasma treated organic or inorganic substrate (col 1, line 50 through col 2, line 8).

This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The species are as follows:

Different photoinitiator compounds and mixtures of compounds as found on pages 10-20 and examples 1-8 of the specification.

During a telephone conversation with Joseph Suhadolnik on 02-19-2009 a provisional election was made without traverse to prosecute the invention of group A and the photoinitiator species found in example 1 of the specification: claims 1-17 and

21. Affirmation of this election must be made by applicant in replying to this Office action. Claims 19 and 20 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP

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§ 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

Information Disclosure Statement

The information disclosure statement filed May 1st 2006 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each document listed that is not in the English language (H. Jacobasch et al reference). It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1-6, 8-11 and 21** are rejected under 35 U.S.C. 102(b) as being anticipated by Bauer et al (US 6548121).

The instant claim 1 is directed towards a process for the production of a strongly adherent metal coating on an inorganic or organic substrate, wherein:

- a. A low temperature plasma treatment, a corona discharge treatment or a flame treatment is carried out on the substrate;
- b. One or more photoinitiators containing at least one ethylenically unsaturated group are applied to the substrate;
- c. The layer is *optionally* dried and is irradiated with electromagnetic waves; and
- d. On such a photoinitiator coated substrate, a metal, half-metal or metal oxide is deposited from the gas phase

It is noted that the step “c” drying step is optional. Since the step is optional it is not required for the claim language to be met.

'121 teaches a process for producing a strongly adhering coating on an organic or inorganic substrate. This method comprises: A low temperature plasma treatment is carried out on the substrate (step a); one or more photoinitiators containing at least one ethylenically unsaturated group are applied to the substrate (step b), and on such a photoinitiator coated substrate, a metal, half-metal or metal oxide is deposited from the gas phase *while* the substrate is irradiated with electromagnetic waves (steps “c” and “d”) (**claims 1 and 2**) (col 1, line 50 through col 2, line 12).

- 3. Regarding **claims 3-6**, '121 teaches many different photoinitiators. The photoinitiator can be benzophenones (**claim 3**) (col 17, lines 49-67). The photoinitiator is preferably a subset of the formulas of **claim 4** (col 6 line 61 through col 7, line 8). In which (IN) is further preferably limited by a subset of the formulas of **claim 5** (col 7, line 9 through col 8, line 4). In which (RG) and (RG') are further

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especially preferably limited by a subset of the formulas of **claim 6** (col 8, line 65 through col 9, line 10). Additionally, example 1 teaches using a photoinitiator which meets the limitations of **claims 4 and 5** (col 23, lines 29-40).

4. Regarding **claim 8-10 and 21**, '121 teaches an example 3, which deposits a metal layer on the photoinitiator layer of example 1. Example 1 exposes the substrate to a plasma formed from a mixture of argon and oxygen (**claims 8, 9 and 21**).

Furthermore, the photoinitiator layer of example 1 is 30 nm thick (**claim 10**) (col 23 line 17 through col 24 line 21).

5. Regarding **claim 11**, '121 teaches performing the application of the photoinitiator (step "b") as soon as possible after the corona discharge treatment (process step "a") and suggests doing so in a continuous process (col 15, lines 15-20). It is clearly envisaged from this that step b would be performed immediately after step "a" and certainly would be performed within 24 hours of step "a".

Additionally, '121 teaches performing step "b" immediately after or within 10 hours of process step "a" (col 28, lines 22-25, as further defined by col 24, lines 55-67).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. **Claims 11-13 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bauer et al (US 6548121).
7. Regarding **claim 11**, '121 teaches performing the application of the photoinitiator (step "b") as soon as possible after the corona discharge treatment (process step "a") and suggests doing so in a continuous process (col 15, lines 15-20). Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to perform step "b" immediately after step "a" and certainly to perform it within 24 hours of step "a".
8. Regarding **claim 12**, '121 teaches that the photoinitiators can be used in combination with a solvent (col 15, lines 7-27), so materials other than photoinitiators are taught to be present in the composition. MPEP 2144.05 (II) states: "Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. '[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.'"

9. Regarding **claim 13**, '121 teaches that the process allows a high throughput per unit time (col 1, lines 50-51). The examiner takes official notice that waiting time between process steps is a well known variable for determining the maximum throughput per unit time of a process. Decreasing the waiting times between processing steps, decreases the total time for the overall process and increases the maximum throughput of a process.

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to reduce the waiting times as much as possible and perform step "c" immediately after step "b" in order to allow for a higher throughput per unit of time as taught to be desirable by '121.

10. Regarding **claim 15**, '121 teaches performing the irradiation step with ultraviolet light (col 2, lines 9-12). Ultraviolet radiation's wavelength ranges from 400nm to 10nm, which overlaps with applicant's claimed range. MPEP 2144.05 states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists."

11. **Claims 7, 14 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bauer et al (US 6548121) as applied to claim 1 above, and further in view of Kohler et al (US 6251963).

'121 teaches that the photoinitiators can be used in combination with a solvent (col 15, lines 7-27), but does not teach that the solvent is a liquid or what should be done with the solvent after the photoinitiator layer is deposited.

However, '963 is also directed towards depositing films of photoinitiators and teaches using liquid solvents with the photoinitiators in order to form a solution which is then deposited on the substrate (col 18, lines 31-48).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to choose to use a liquid solvent with the photoinitiator compositions containing a solvent of '121 as a known manufacturing option for depositing a film of a photoinitiator composition, which would produce predictable results (**claim 7**).

12. Regarding **claim 14**, '963 teaches that after the substrate is coated with the liquid solution photoinitiator, the solvents are normally removed by drying (col 19, lines 29-31).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to then dry the liquid solution after the layer has been deposited since it was recognized to be the normal procedure for such liquid solvent bearing coatings.

'963 further teaches drying the photoinitiator film at elevated temperatures (col 25, lines 51-52) and that it is advantageous to dry photoinitiators at elevated temperatures under a vacuum (col 4, lines 39-42). The use of a reduced pressure environment with the heating step would require that the coating be heated inside a vacuum chamber, which would be, by definition, an oven.

Thus it would have further been obvious to a person of ordinary skill in the art at the time of invention to dry the photoinitiator coating at elevated temperatures

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under a vacuum in an oven, since it was known to the art to be an advantageous method for drying photoinitiators and would produce predictable results (**claim 14**).

13. Regarding **claim 16**, '121 teaches that the method is used for forming photoinitiator layers for image forming resist coatings (col 23, lines 10-16), but does not say how such images are formed by resist technology

However, '963 further teaches that images are formed by resist technology by covering parts of the wet or dry resist layer (after step "b") with a photomask and then irradiating the layer with electromagnetic waves to crosslink a pattern in the resist (step "c" irradiation) and removing the unexposed (not crosslinked) regions of the photoresist by using a solvent (col 21, lines 13-23).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to modify '121 to cover the deposited photoinitiator layer with a photomask after step "b", so that the irradiation step would only crosslink a pattern in the coating (instead of the entire coating) and then to remove the non-crosslinked regions of the coating by using a solvent, in order to form an image in the coating as desired by '121. Using this method is obvious, because it was a known method for producing an image in a photoinitiator layer and would produce predictable results.

14. **Claims 1,3-6, 8, 9, 11-13, 15, 17 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al (US 6153503) in view of Bauer et al (US 6548121) as applied to claim 1 above.

Regarding **claims 1 and 17**, Lin et al teaches a method for producing electrodes on a substrate by using a lithography method with a photoresist (col 3,

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lines 19-22). In this method, a photoinitiator (in a photoresist) is applied to the surface of the substrate, the layer is irradiated with electromagnetic waves (which as is known to the photoresist art, as discussed previously, will crosslink certain areas of the coating) and be *developed*, so that regions of the coating that are not crosslinked are removed, forming a pattern in the photoresist. The patterned surface is then sputter coated (a gas phase deposition) with an electrode material, such as aluminum metal. The substrate is then treated with a solvent and mechanically lifted off, so that the photoinitiator layer is removed, leaving the pattern of electrodes on the substrate surface (figure 1, col 4, lines 4-24). However, Lin et al does not teach what photoinitiators are to be used or the use of a plasma treatment on the substrate surface prior to depositing the photoinitiator.

'121 teaches a method for depositing photoinitiator containing layers for image forming resist coatings, which are strongly adhered which is taught to be important for resist applications (col 23, lines 10-16). It teaches that such photoinitiator coatings will be strongly adhered to the substrate by using a process that includes: subjecting the substrate to a low-temperature plasma discharge before depositing a coating comprising a photoinitiator that contains at least one ethylenically unsaturated group, then coating the substrate with a composition comprising one ethylenically unsaturated monomer or oligomer (col 1, line 59 through col 2, line 8).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention using the Lin et al process to substitute the Lin et al method of

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depositing a photoinitiator containing coating with the '121 taught method for depositing said film then performing the remaining process of Lin et al. Such a person would be motivated to do so in order to produce a strongly adhering photoinitiator coating (**claims 1 and 17**).

15. Regarding **claims 3-6, 8, 9, 11-13, 15 and 21**, they are rejected for the same reasons they were previously in '121, but now applied to the method of Lin et al.

16. **Claim 7, 14 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al (US 6153503) in view of Bauer et al (US 6548121) further in view of Kohler et al (US 6251963), as applied to claims 7, 14 and 16 above.

17. Regarding **claims 7 and 14**, they are rejected for the same reasons they were previously in '121 further in view of '963, but now applied to the method of Lin et al.

18. Regarding **claim 16**, as discussed above in the rejection of claim 17, Lin et al in view of '121 teaches all the limitations of claim 16, except it does not teach how the non-crosslinked parts of the coating are removed, only teaching that they are "developed."

However, '963 teaches that development can be done by treating the surface with a solvent (col 21, lines 13-23).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to use a solvent to remove the non-crosslinked polymers since it was known to the art to be a suitable method for developing such coatings and would produce predictable results.

Double Patenting

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The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

19. Claims 1,2, 4, 7-17 and 21 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-18 of copending Application No. 10/556609. Although the conflicting claims are not identical, they are not patentably distinct from each other because the current claims are merely different combinations and permutations of the limitations of '609, particularly formulas (I) and (II), steps a-c of claim 1 and d3 of claim 2 and as detailed in the rejections above,

This is a provisional obviousness-type double patenting rejection.

20. Claims 3, 5 and 6 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-18 of copending Application No. 10/556609 in view of US 6548121. '609 does not clearly

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teach the additional photoinitiators of claims 3, 5 and 6, however, '121 also teaches photoinitiators which are covered by claims 3, 5 and 6 as suitable for the formation of photoinitiator films on such substrates (benzophones are taught at col 10, lines 20-35, and the others are in '121 claims 5 and 9). Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to use those alternative photoinitiators in the coating, since they were known to be suitable for that purpose and would produce predictable results.

This is a provisional obviousness-type double patenting rejection.

Conclusion

21. No current claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOEL G. HORNING whose telephone number is (571) 270-5357. The examiner can normally be reached on M-F 9-5pm with alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael B. Cleveland can be reached on (571)272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. G. H./
Examiner, Art Unit 1792

/Michael Cleveland/
Supervisory Patent Examiner, Art Unit 1792